

***IN THE CLAIMS***

Please amend the claims as follows:

1. (Currently amended) A method for coding or decoding an image, comprising:  
providing an encoded macroblock bit stream that includes global motion vectors parameters associated with a current image frame;  
deriving local motion vectors from the global motion vectors parameters in the encoded macroblock bit stream for individual macroblocks in the current image frame;  
using bilinear interpolation to derive the local motion vectors from the global motion parameters in the encoded macroblock bit stream;  
using the local motion vectors to identify reference blocks in a reference frame without generating or modifying the reference frame; and  
using the identified reference blocks to encode or decode the macroblocks in the current image frame.
  
2. (Currently amended) A method according to claim 1 including:  
identifying four global motion vectors associated with corners of the current image frame; and  
generating the local motion vectors by using bilinear interpolation to interpolate interpolating the four global motion vectors to locations of the macroblocks in the current image frame.
  
3. (Currently amended) A method for coding or decoding an image, comprising:  
providing global motion parameters associated with a current image frame;  
deriving local motion vectors from the global motion parameters for individual macroblocks in the current image frame;  
using the local motion vectors to identify reference blocks in a reference frame;  
using the identified reference blocks to encode or decode the macroblocks in the current image frame; and  
deriving the local motion vectors from the global motion parameters as follows:

$$v(x, y) = r^0 + \left( \frac{x}{H-a} \right) r^x + \left( \frac{y}{V-a} \right) r^y + \left( \frac{x}{H-a} \right) \left( \frac{y}{V-a} \right) r^{xy} \quad (1)$$

where  $v^{00}$ ,  $v^{H0}$ ,  $v^{0V}$ , and  $v^{HV}$  represent the global motion parameters at four corners of the current image frame, (0,0), ( $H/4$ , 0), (0,  $V/4$ ), and ( $H/4$ ,  $V/4$ ), respectively;  $x$  and  $y$  represent an upper-left pixel location for the macroblock; and  $r^0$ ,  $r^x$ ,  $r^y$ , and  $r^{xy}$  are the following:

$$r^0 = v^{00}$$

$$r^x = v^{H0} - v^{00}$$

$$r^y = v^{0V} - v^{00}$$

$$r^{xy} = v^{00} - v^{H0} - v^{0V} + v^{HV}$$

4. (Currently amended) A method according to claim 1 including generating ~~codewords that identify the macroblocks that use the global motion parameters to generate associated local motion vectors deriving local motion vectors from the global motion parameters for individual macroblocks in the current image frame independently of types of local motion vectors or global motion vectors derived for other macroblocks in the current image frame.~~

5. (Original) A method according to claim 1 including:

using the derived local motion vectors to identify reference blocks in the reference frame that are substantially the same as the macroblocks in the current image frame; and  
encoding the macroblocks as copy type macroblocks that are decoded by copying the identified reference blocks into the macroblocks.

6. (Original) A method according to claim 5 including:

identifying residuals between the reference blocks and the macroblocks; and  
encoding only the residuals for the macroblocks.

7. (Currently amended) A method for coding or decoding an image, comprising:  
receiving an encoded bit stream including macroblocks identified as global motion vector coded and either copy type or residual type;  
receiving no local vectors in the encoded bit stream for the macroblocks identified as global motion vector coded;  
~~deriving local motion vectors only for the global motion vector coded macroblocks;~~

using bilinear interpolation to derive local motion vectors for individual macroblocks only from global motion parameters in the encoded bit stream and independently of types of local motion vectors or global motion vectors used for other macroblocks in the current image frame;

using the derived local motion vectors to identify reference blocks in a reference frame;

copying the identified reference blocks for the copy type macroblocks; and

adding encoded residuals to the identified reference blocks for the residual type macroblocks.

8. (Currently amended) A method according to claim 1 including:

~~encoding some of the macroblocks in the current image frame using global motion vector coding where the global motion parameters are used to generate local motion vectors for the macroblocks; and~~

~~encoding other macroblocks in the current image frame using another coding scheme deriving the local motion vectors as follows:~~

$$\underline{v}(x, y) = \underline{r}^0 + \left( \frac{x}{H-a} \right) \underline{r}^x + \left( \frac{y}{V-a} \right) \underline{r}^y + \left( \frac{x}{H-a} \right) \left( \frac{y}{V-a} \right) \underline{r}^{xy}$$

where  $v^{00}$ ,  $v^{H0}$ ,  $v^{0V}$ , and  $v^{HV}$  represent the global motion vectors at four corners of the current image frame, (0,0), (H-a, 0), (0, V-a), and (H-a, V-a), respectively; a represents the pixel subblock size; x and y represent an upper-left pixel location for the macroblock; and  $r^0$ ,  $r^x$ ,  $r^y$ , and  $r^{xy}$  are the following:

$$\underline{r}^0 = \underline{v}^{00}$$

$$\underline{r}^x = \underline{v}^{H0} - \underline{v}^{00}$$

$$\underline{r}^y = \underline{v}^{0V} - \underline{v}^{00}$$

$$\underline{r}^{xy} = \underline{v}^{00} - \underline{v}^{H0} - \underline{v}^{0V} + \underline{v}^{HV}.$$

9. (Currently amended) A method according to claim 1 including:

generating subblock local motion vectors for individual subblocks in same macroblocks using the global motion parameters;

identifying individual reference subblocks in the reference frame pointed to by the subblock local motion vectors; and

separately encoding and decoding the subblocks using the identified reference subblocks.

10. (Currently amended) A decoder, comprising:

a processor receiving encoded image frames wherein a common set of global motion estimation parameters are included in the encoded image frames for identified macroblocks and no local motion vectors are included in the encoded image frames for the identified macroblocks, the processor deriving local motion vectors for the identified individual macroblocks from the global motion estimation parameters independently of types of local motion vectors or global motion vectors used for other adjacent macroblocks in the encoded image frames, using the derived local motion vectors to identify reference blocks in a current reference frame, and then using the reference blocks to reconstruct the identified macroblocks in a current frame.

11. (Currently amended) A decoder according to claim 10 wherein the processor generates the local motion vectors by bilinearly interpolating the global motion estimation parameters to locations of the macroblocks in the current frame.

12. (Previously presented) A decoder according to claim 10 wherein the processor detects code words included along with the encoded image frames that identify global motion vector coded macroblocks that do not have associated local motion vectors in the encode image frames.

13. (Original) A decoder according to claim 12 wherein the code words indicate when the macroblocks are a direct copy of the reference blocks.

14. (Original) A decoder according to claim 12 wherein the code words indicate when residuals are added to the reference blocks to reconstruct the macroblocks.

15. (Currently amended) A decoder according to claim 10 wherein the processor uses the global motion estimation parameters to generate local motion vectors for different subblocks, the processor using the local motion vectors to identify different reference

subblocks in the current reference frame and then using the identified reference subblocks to reconstruct the subblocks in the current frame.

16. (Currently amended) An encoder, comprising:

a processor encoding an image frame by encoding a set of global motion estimation parameters for an image frame and:

identifying macroblocks in the image frame that have local motion estimation parameters derived only from the global motion estimation parameters and no local motion estimation parameters are included in the encoded image frame for the identified macroblocks in which local motion vectors associated with the identified macroblocks should be derived from the global motion estimation parameters in the encoded macroblock bit stream using bilinear interpolation; and

not encoding local motion vectors associated with the identified macroblocks.

17. (Currently amended) An encoder according to claim 16 wherein the local motion estimation parameters are used to identify locations in a reference frame that are used to generate images for the identified macroblocks without the global motion estimation parameters generating or modifying the reference frame.

18. (Currently amended) An encoder according to claim 16 wherein the processor compares the global motion estimation parameters with block motion estimation parameters to determine which macroblocks use the local motion estimation parameters derived from the global motion estimation parameters.

19. (Currently amended) An encoder according to claim 16 wherein the processor generates codewords that identify the macroblocks that derive the local motion estimation parameters only from the global motion estimation parameters.

20. (Currently amended) An encoder according to claim 16 wherein the processor identifies macroblocks that are directly copied from reference blocks pointed to by the local motion estimation parameters derived from the global motion estimation parameters.

21. (Currently amended) An encoder according to claim 16 wherein the processor encodes residuals for the identified macroblocks but no local motion estimation parameters.

22. (Original) An encoder according to claim 16 wherein the processor performs run length coding on the encoded image frame.

23. (Previously presented) An encoder according to claim 16 wherein the macroblocks are  $N \times N$  pixel arrays, where  $N$  is an integer; subblocks are  $M \times M$  pixel arrays, where  $M$  is an integer less than or equal to  $N$ .

24. (Currently amended) The method according to claim 1 wherein the local motion parameters are derived from the global motion parameters as follows:

providing global motion parameters vectors for four corners of the current frame;  
style="padding-left: 40px;">interpolating the global motion parameters to a pixel location associated with the macroblock;  
style="padding-left: 40px;">using a result of the interpolation to identify a location in the reference frame; and  
style="padding-left: 40px;">using contents of the reference frame at the identified location to generate image data for the macroblock.